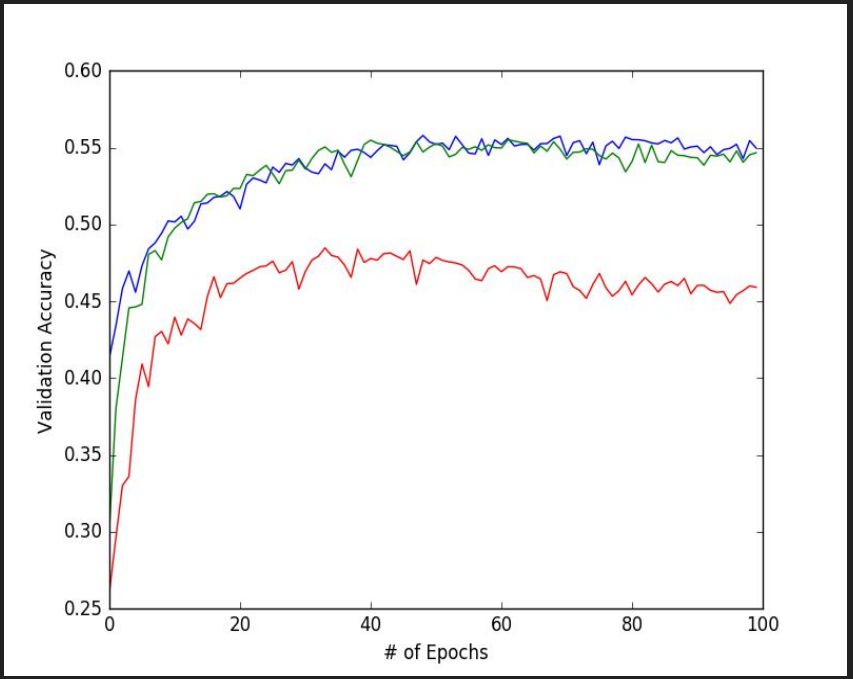
Semi-supervised training of CNNs

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Semi-supervised training of CNNs

- Semi-supervised learning typically makes use of a small amount of labeled data and a large amount of unlabeled data
  - Manually labeling images is a time consuming process, so reducing the amount of labeled data is ideal
- Through the use of unlabeled images, we can train a convolutional auto-encoder to compress and decompress an image
  - This will make the autoencoder learn features that are important to reconstructing images
- We can initialize a classification CNN with the auto-encoder's learned features, and train it using a small set of labeled images
  - The result is a CNN that can classify images with the accuracy of a similar CNN trained on a large set of labeled data
- We also implemented a stacked what-where auto-encoder to aid in the semi-supervised learning

Results



- CNN trained with 10,000 labeled images
- CNN trained with 50,000 labeled images
- CNN trained with 50,000 unlabeled images and 10,000 labeled images

Original Image

Basic Auto-encoder

What-where Auto-encoder



